

2005 Gulf Coast Hurricanes: The Public Health and Medical Response

Updated January 20, 2006

Congressional Research Service

<https://crsreports.congress.gov>

RL33096

Summary

Hurricane Katrina struck the Gulf Coast in late August 2005, causing catastrophic wind damage and flooding in several states, and a massive dislocation of victims across the country. The storm was one of the worst natural disasters in the nation's history. Estimates are that more than 1,200 people were killed and about 2 million displaced. Hurricane Rita, which made landfall along the Gulf Coast in late September 2005, was ultimately less lethal than Katrina, but prompted aggressive preparedness efforts by governments and citizens shaken by the devastation of the earlier storm.

In response to a series of disasters and terrorist attacks over the past decade, in particular the terror attacks of 2001, Congress, the Administration, state and local governments and the private sector have made investments to improve disaster preparedness and response. New federal authorities and programs to strengthen the nation's public health system were introduced in comprehensive legislation in 2002. Congress also created the Department of Homeland Security (DHS) in 2002 to provide national leadership for coordinated preparedness and response planning. A new National Response Plan (NRP), launched by DHS in December 2004, met its first major test in the response to Hurricane Katrina.

According to the NRP, the Department of Health and Human Services (HHS) is tasked with coordinating the response of the public health and medical sectors following a disaster. HHS works with several other agencies to accomplish this mission, which includes assuring the safety of food, water and environments, treating the ranks of the ill and injured, and identifying the dead. HHS activities are coordinated with those of other lead agencies under the overall leadership of DHS.

Congress and others will review the response to Hurricanes Katrina and Rita with an eye toward assessing how well the NRP worked as an instrument for coordinated national response, and how well various agencies at the federal, state and local levels carried out their missions under the plan. Hurricane Katrina dealt some familiar blows in emergency response. The failure of communication systems, and subsequent difficulties in coordination, challenged response efforts in this disaster as with others before it. Hurricane Katrina also pushed some response elements, such as surge capacity in the healthcare workforce, to their limits. The response to Hurricane Katrina has also called attention to the matter of disaster planning in healthcare facilities, and the potential role of health information technology in expediting the care of displaced persons. Policymakers will no doubt study these elements of the Katrina response and seek options for continued improvement in national disaster preparedness and response.

This report discusses the NRP and its components for public health and medical response, provides information on key response activities carried out by agencies in HHS and DHS, and discusses certain issues in public health and medical preparedness that have been raised by the response to the 2005 Gulf Coast hurricanes. This report will be updated as circumstances warrant.

Contents

Introduction	1
Federal Authorities and Responsibilities	2
The Stafford Act	2
The National Response Plan	2
Declarations of Public Health Emergencies	4
The Public Health Response	6
Overview	6
Public Health Challenges	6
Selected HHS Agency Actions	7
HHS Office of the Secretary	7
Agency for Toxic Substances and Disease Registry	7
Centers for Disease Control and Prevention	8
Food and Drug Administration	9
The Medical Response	9
Overview	9
Medical and Healthcare Challenges	9
Selected HHS Agency Actions	10
Centers for Medicare and Medicaid Services	10
Health Resources and Services Administration	10
National Institutes of Health	11
Substance Abuse and Mental Health Services Administration	11
Department of Homeland Security	12
National Disaster Medical System	12
Department of Defense	14
Department of Veterans Affairs	14
Issues for Congress	14
All-Hazards Preparedness	14
Coordinated Needs Assessments	15
Disaster Planning in Healthcare	16
Overview	16
Regulation of Institutions and Services	17
Community-based Disaster Planning	18
Promising Practices	19
Options for Congress	19
National Disaster Medical System	19
Volunteer Health Professionals	21
Health Information Technology	23
Additional CRS Reports	23

Contacts

Author Information	24
--------------------------	----

Introduction

Hurricane Katrina struck the Gulf Coast in late August 2005, causing extensive wind damage and catastrophic flooding, and leading to Presidential disaster declarations for Alabama, Florida, Louisiana and Mississippi. The storm was one of the worst natural disasters in the nation's history. Hurricane Rita, which made landfall along the Gulf Coast in late September 2005, was somewhat less severe than Katrina when it hit. But a few days earlier in the Gulf it had been a powerful category five hurricane. Government officials and citizens shaken by the devastation of the earlier storm mounted aggressive preparedness efforts in anticipation of Hurricane Rita, drawing on lessons learned from Katrina just weeks earlier.

Hurricane Katrina is estimated to have killed more than 1,200 people, and displaced about 2 million. The death toll continues to be revised, as bodies continue to be found, and investigations into the causes of death of others continue.¹ More than 4,000 persons are still reported missing. The Federal Emergency Management Agency (FEMA) recently increased its estimate of the number of persons displaced by Hurricanes Katrina and Rita to about 2 million.²

The logistical hurdles posed by Hurricane Katrina were formidable. Communications were knocked out in hard-hit areas, which compromised the process of assessing and prioritizing needs. Physical access was blocked in some areas, and civil disorder was a problem in some others. Each kept responders from delivering aid. In some cases, victims were isolated without water and medicines, and hospitals that had not been evacuated before the hurricane were unable to sustain operations. Each circumstance required the emergency evacuation of critically ill patients to a triage center, which then itself became overwhelmed. Federal, state, and local governments, businesses and corporations, the faith community and other volunteers all pitched in to speed relief to Katrina's victims, but keeping all of it coordinated was a challenge.

Responding to a catastrophe of the scope of Hurricane Katrina requires that a variety of public health and medical activities be carried out and coordinated. Public health activities are those that identify, address or prevent health problems in populations. Examples include assuring the safety of food and water, preventing the spread of disease in shelters, evaluating the safety of neighborhoods for rehabilitation, and assuring the health and safety of responders. Medical activities are those that deliver healthcare services to individuals. Examples include treatment of injuries, continuity of care for those with chronic illnesses, mental health counseling, and cause-of-death investigation.

The medical response to Hurricane Katrina may have posed the greater challenge. The public health response required the coordination of variety of agencies, community-based organizations, and private parties at different levels of government, though these entities had generally worked together in the past. The medical response, in contrast, required the coordination of a broader mix of federal, state and local government agencies, private parties and others, with no comparable recent precedent or experience in such an effort on this scale.

Over the past decade, in response to the Oklahoma City bombing, the terror attacks of 2001 and several serious natural disasters, Congress and the Administration created new authorities, structures and plans to assure that government at all levels can respond well to disasters like Hurricane Katrina. Local and state governments are to be the first responders in a disaster. When

¹ National Oceanic and Atmospheric Administration, National Weather Service, National Hurricane Center, "Tropical Cyclone Report, Hurricane Katrina," Dec. 20, 2005, p. 10 ff., at http://www.nhc.noaa.gov/pdf/TCR-AL122005_Katrina.pdf.

² Spencer S. Hsu, "2 Million Displaced by Storms," *Washington Post*, Jan. 13, 2006

their resources are overwhelmed, federal assistance is provided under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Stafford Act) and other authorities. A new National Response Plan (NRP) places the Secretary of Homeland Security in charge of coordinating the overall federal response. The Secretary of Health and Human Services (HHS) is in charge of coordinating the federal public health and medical response during a disaster.

In the wake of Hurricanes Katrina and Rita, Congress is likely to review response efforts, recent public health preparedness laws and the NRP. While even the best plan and response may be overwhelmed in a disaster of the scope of Hurricane Katrina, Congress may nonetheless find opportunities to revisit management structures, programs and goals in order that national response capability can be steadily improved.

This report will discuss relevant authorities and response plans that guided the public health and medical response to the 2005 hurricanes. Given its catastrophic scope, the response to Hurricane Katrina will be the primary focus of this report, with reference to the Hurricane Rita response when relevant. The roles and response activities of selected agencies in HHS and DHS will be discussed. Finally, a number of policy issues will be discussed. This report will be updated as circumstances warrant. For a broader discussion of all-hazards public health and medical preparedness, see CRS Report RL31719, *An Overview of the U.S. Public Health System in the Context of Emergency Preparedness*.

Federal Authorities and Responsibilities

The Stafford Act

The Stafford Act authorizes the President to issue major disaster and emergency declarations, whereupon federal agencies are authorized to provide assistance to affected states.³ Through executive orders, the President has delegated to the Federal Emergency Management Agency (FEMA), within DHS, responsibility for administering the major provisions of the Stafford Act. In calendar year 2005, President Bush issued 48 major disaster declarations, including those for Alabama, Florida, Louisiana, and Mississippi for Hurricane Katrina, and for Texas and Louisiana for Hurricane Rita.⁴

Activities undertaken under authority of the Stafford Act are provided through funds appropriated to the Disaster Relief Fund (DRF). Federal assistance supported by DRF money is used by states, localities, and certain non-profit organizations to provide mass feeding and shelter, restore damaged or destroyed facilities, clear debris, and aid individuals and families with uninsured needs, among other activities. Federal agencies that receive mission assignments from DHS and provide assistance pursuant to the NRP are also reimbursed through funds appropriated to the DRF. In addition to the FEMA assistance authorized by the Stafford Act, a wide range of aid is provided by other federal agencies under their general statutory authority.

The National Response Plan

The *National Response Plan* (NRP) is the framework under which federal and voluntary agencies are instructed to operate when a disaster occurs.⁵ The NRP was released by DHS in December

³ 42 U.S.C. §5121 et seq, available at <http://www.fema.gov/library/stafact.shtm>. Also see CRS Report RL33053, *Federal Stafford Act Disaster Assistance: Presidential Declarations, Eligible Activities, and Funding*, by Keith Bea.

⁴ For a list of federal disaster declarations, see <http://www.fema.gov/news/disasters.fema>.

⁵ See CRS Report RL32803, *The National Preparedness System: Issues in the 109th Congress*, by Keith Bea.

2004, replacing the previous Federal Response Plan. The NRP is an administrative plan and does not establish new federal authorities. In general, federal responsibilities in the plan are intended to assist state and local authorities, not to replace them.

According to the NRP, which is under the overall coordination of the Secretary of Homeland Security, the Secretary of HHS is tasked with *Emergency Support Function* (ESF) #8, the coordination of public health and medical services, as laid out in the plan's ESF#8 annex.⁶ HHS is responsible for coordinating the following activities under ESF#8, and may request assistance from 14 designated support agencies and the American Red Cross as needed:

- Assessment of public health and medical needs;
- Health surveillance;
- Medical care personnel;
- Health and medical equipment and supplies;
- Patient evacuation;
- Patient care;
- Safety and security of human drugs, biologics, and medical devices, veterinary drugs, and other HHS-regulated products;
- Blood and blood products;
- Food safety and security;
- Agriculture safety and security (principally with regard to food-producing animals and animal feeds and drugs);
- Worker health and safety;
- All-hazard public health and medical consultation, technical assistance and support;
- Behavioral health care;
- Public health and medical information;
- Vector control (e.g., control of disease-carrying insects and rodents);
- Potable water, wastewater and solid waste disposal;
- Victim identification and mortuary services; and
- Protection of animal health (principally with regard to HHS-regulated animal feeds and drugs).

The HHS *Concept of Operations Plan (CONOPS) for Public Health and Medical Emergencies* outlines how HHS plans to implement its emergency preparedness and response authorities and establishes the department's policies for emergency preparedness and response.⁷ The CONOPS plan designates the Secretary of HHS as the official responsible for the overall response to public health emergencies. The Assistant Secretary for Public Health Emergency Preparedness (ASPHEP) is to act on behalf of the Secretary to direct and coordinate the department's efforts,

⁶ Department of Homeland Security, National Response Plan, Dec. 2004, (hereafter called the NRP), Annex ESF#8, at http://www.dhs.gov/interweb/assetlibrary/NRP_FullText.pdf. See also HHS, "HHS Maintains Lead Federal Role for Emergency Public Health and Medical Response," press release, Jan. 6, 2005.

⁷ HHS, "Concept of Operations Plan (CONOPS) for Public Health and Medical Emergencies," Mar. 2004, at http://www.hhs.gov/nvpo/pandemicplan/hhs_conops.pdf.

including on-scene operations and liaison with the DHS and other federal agencies. The plan lays out additional responsibilities of HHS offices and agencies during an emergency.⁸

HHS does not bear primary responsibility for *mass care*, which is the coordination of non-medical services such as shelter, feeding, emergency first aid, and efforts to reunite displaced family members. Mass care is the responsibility of DHS and is carried out by FEMA and the American Red Cross according to ESF#6. HHS is also not responsible for *urban search and rescue*, which is also the responsibility of DHS and FEMA pursuant to ESF#9. Furthermore, HHS may depend on numerous other agencies to carry out certain of their ESF activities (e.g., public safety, road clearing and power restoration) before some ESF#8 activities can commence.

Many of HHS's responsibilities under ESF#8 are within the department's primary control. An important exception is the National Disaster Medical System (NDMS), which comprises teams of medical professionals who are pretrained to deploy and provide medical services in the immediate aftermath of a disaster before other federal assets arrive. NDMS, which previously operated under the Public Health Service in HHS, was transferred to DHS in the Homeland Security Act of 2002 (P.L. 107-296), and now operates under FEMA. NDMS will be discussed in greater depth in subsequent sections of this report. Certain other critical components of the medical response are housed in the Departments of Defense and Veterans Affairs, and the private sector.

Declarations of Public Health Emergencies

Absent an emergency, most public health authority, such as mandatory disease reporting, licensing of healthcare providers and facilities, and quarantine authority, rests with states as an exercise of their police powers. Most states have considerable powers in responding to public health events, and most can also declare public health emergencies to expand their powers further when needed.⁹ The federal role is largely assistive through the provision of funding, additional personnel, and specialized services such as laboratory testing and surveillance. This model does not change substantially in emergencies, though there are statutory provisions for some specific emergency expansions of federal public health authority.

Section 319 of the Public Health Service Act provides broad authority for the Secretary of HHS to declare a public health emergency at the federal level. Following the 2001 terror attacks, Congress updated this authority in the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (P.L. 107-188). One provision in the bioterrorism act allows the Secretary, during a public health emergency, to waive certain requirements for provider participation in serving individuals enrolled in Medicare, Medicaid and the State Children's Health Insurance Program (SCHIP).¹⁰ Otherwise, the statutory authority for a federal declaration of a public health emergency rests in broad language, as follows:

⁸ For more information, see <http://www.hhs.gov/ophep/index.html>. The role of the ASPHEP is further explained in HHS, "Office of Public Health Emergency Preparedness Statement of Organization, Functions, and Delegations of Authority," 70 *Federal Register* 5183, Feb. 1, 2005.

⁹ A listing of legal authorities invoked by Hurricane Katrina-affected states is provided by the American Health Lawyers Association at

http://www.healthlawyers.org/Content/NavigationMenu/News_Center/Disaster_Relief_Resources.htm. For a discussion of the exercise of federal and state authorities in response to recent shortages of influenza vaccine, see CRS Report RL32655, *Influenza Vaccine Shortages and Implications*, by Sarah A. Lister.

¹⁰

42 U.S.C. §1320b-5. This waiver authority also requires a concurrent Presidential declaration of a major disaster or

If the Secretary determines, after consultation with such public health officials as may be necessary, that—

- (1) a disease or disorder presents a public health emergency; or
- (2) a public health emergency, including significant outbreaks of infectious diseases or bioterrorist attacks, otherwise exists,

the Secretary may take such action as may be appropriate to respond to the public health emergency, including making grants, providing awards for expenses, and entering into contracts and conducting and supporting investigations into the cause, treatment, or prevention of a disease or disorder as described in paragraphs (1) and (2).¹¹

The declaration expires upon the Secretary's determination that an emergency no longer exists, or in 90 days, whichever comes first, but is renewable upon the Secretary's finding that an emergency persists.

In response to Hurricane Katrina, the HHS Secretary Michael Leavitt declared public health emergencies in Alabama, Florida, Louisiana and Mississippi on August 31, 2005, two days after the storm made landfall along the Gulf Coast. On September 4, as thousands of evacuees from the devastated city of New Orleans began arriving in Texas, the Secretary declared a public health emergency in that host state. The additional host states of Arkansas, Colorado, Georgia, North Carolina, Oklahoma, Tennessee, West Virginia, and Utah were declared by the Secretary on September 7. On December 31, HHS Secretary Leavitt renewed the determinations of public health emergency for all Katrina-affected states through January 31, 2006.¹² On September 23, in anticipation of Hurricane Rita's landfall the following day, the Secretary declared public health emergencies in Texas and Louisiana. These declarations have since expired.¹³ Prior to Hurricane Katrina, the only recent incident for which a federal public health emergency had been declared was the terror attack of September 11, 2001. That declaration applied to all states.

There is no additional statute or regulation that clarifies this authority with regard to stipulating thresholds or conditions of the determination. The decision to declare emergencies in certain host states in response to Hurricane Katrina, but not in all states, appears to be an exercise of the Secretary's discretion. There is also no precedent for this authority to be used to supercede or assume public health authorities that are generally reserved to states, though the Secretary does have specific emergency authorities elsewhere in statute, such as the authority to impose domestic quarantine restrictions when warranted.¹⁴

emergency pursuant to the Stafford Act.

¹¹ 42 U.S.C. §247d.

¹² HHS public health emergency declarations in response to Hurricane Katrina are found at <http://www.hhs.gov/katrina/emergency.html>.

¹³ HHS public health emergency declarations in response to Hurricane Rita are found at <http://www.hhs.gov/emergency/ritadeclaration.html>.

¹⁴ A listing of HHS emergency authorities is found in Table 2 of CRS Report RL33064, *Organization and Mission of the Emergency Preparedness and Response Directorate: Issues and Options for the 109th Congress*, by Keith Bea. See also CRS Report RL33201, *Federal and State Quarantine and Isolation Authority*, by Kathleen S. Swendiman and Jennifer K. Elsea.

The Public Health Response

Overview

Federal leadership for public health emergency response rests with the Secretary of HHS, with important responsibilities in the Office of Public Health Emergency Preparedness (OPHEP) and the Centers for Disease Control and Prevention (CDC).

Much of the support provided by HHS to affected states and communities could normally be provided in the absence of federal or state declarations of public health emergencies or disasters, through assistance mechanisms that are used regularly in response to public health threats such as outbreaks of foodborne disease. Because there has been a presidentially-declared disaster and HHS has received mission assignments from DHS in the wake of Hurricanes Katrina and Rita, the costs of HHS response activities will generally be reimbursed through the DRF administered by FEMA.¹⁵

Given the scope of the public health disaster caused by Hurricane Katrina, virtually all agencies and offices in HHS were engaged in the response.¹⁶ Key public health challenges and response efforts are described below. A number of HHS agencies have medical response roles as well, which are discussed in a subsequent section.

Public Health Challenges

Many of the public health challenges posed by Hurricane Katrina were familiar and anticipated, based on experience with other hurricanes and floods. Flooding compromises the safety of water supplies and the integrity of sewage disposal, leading to threats of food and waterborne illness. Power line damage and power outages increase the risk of foodborne illness and electrocution. Hurricane wind damage may cause primary traumatic injury, while also setting the stage for subsequent chain saw injuries, punctures, and other wounds. Bites from dogs, venomous snakes, and insects are also seen. Hurricanes and floods also carry in their wake some predictable causes of death, including drowning, automobile crashes, carbon monoxide poisoning, and chronic conditions exacerbated by the loss of access to the healthcare system.¹⁷

CDC notes that before 1990, the majority of hurricane-related deaths in the United States resulted from drowning caused by storm surges.¹⁸ With more attention to early warning and evacuation since then, indirect causes of death such as electrocution, carbon monoxide poisoning and injury associated with cleanup have predominated. But despite warnings of the advancing storm, the majority of deaths from Hurricane Katrina resulted from coastal storm surges and from flooding in New Orleans.

The catastrophic scope of Hurricane Katrina presented some unusual public health threats. News reports suggested that deaths may have resulted from dehydration and heat stress, especially in situations in which fresh water was scarce and where victims were crowded into poorly ventilated

¹⁵ For more information, see CRS Report RL33053, *Federal Stafford Act Disaster Assistance: Presidential Declarations, Eligible Activities, and Funding*, by Keith Bea.

¹⁶ For more information on specific agency activities see HHS, "What HHS Agencies Are Doing," at <http://www.hhs.gov/katrina/hhsagencies.html>.

¹⁷ CDC has prepared a list of public health reports on several recent floods, hurricanes, and the 2004 Asian tsunami at <http://www.bt.cdc.gov/disasters/hurricanes/mmwr.asp>.

¹⁸ CDC, "Public Health Response to Hurricanes Katrina and Rita—Louisiana, 2005," *MMWR*, vol. 55(2), pp. 29-30, Jan. 20, 2006.

areas, especially where they had pre-existing medical conditions. There were also reports of homicide, suicide and euthanasia.

Selected HHS Agency Actions

HHS Office of the Secretary

The HHS Office of the Secretary is the point of coordination for all ESF#8 public health and medical support functions under the NRP. HHS set up a website cataloging departmental and agency actions and other information regarding Hurricanes Katrina and Rita.¹⁹ As noted above, the HHS Secretary declared federal public health emergencies in several states. The Office of the Surgeon General and the OPHEP sought to identify and mobilize healthcare professionals and relief personnel to assist in relief efforts. In addition, more than 2,000 Commissioned Corps officers were deployed to the Gulf region before, during, and after Hurricanes Katrina and Rita, to assist in a number of public health and medical activities.²⁰

One immediate element of HHS response was the activation of Emergency Operations Centers (EOCs) at HHS headquarters in Washington, DC and at numerous HHS agencies. When activated, the EOCs are staffed round-the-clock, are electronically connected with each other, and are also connected with the Homeland Security Operations Center (HSOC) at DHS, which in turn receives inputs from other Cabinet departments. This system of continuous communication and coordination is an example of the changes that have been made in national public health response capability in the aftermath of the September 11 and anthrax attacks of 2001, though there is still work to be done in assuring that all relevant state agencies have continuous EOC communication with those at the federal level.²¹

Agency for Toxic Substances and Disease Registry

The Agency for Toxic Substances and Disease Registry (ATSDR), which is administratively under the Centers for Disease Control and Prevention (CDC), is directed by congressional mandate to perform specific functions concerning the effect on public health of exposure to hazardous substances in the environment.²² These functions include public health assessments of hazardous waste sites, health consultations concerning specific hazardous substances, health surveillance and registries, response to emergency releases of hazardous substances, applied research in support of public health assessments, information development and dissemination, and education and training concerning hazardous substances. ATSDR has conducted health hazard assessments following a large oil spill in St. Bernard Parish, LA, that resulted from Hurricane Katrina.²³

¹⁹ See <http://www.hhs.gov/emergency/hurricane.html>.

²⁰ HHS, "New Initiative Announced to Transform the U.S. Public Health Service Commissioned Corps," press release, Jan. 18, 2006.

²¹ A listing of federal coordinating mechanisms in emergencies is found in Table 3 in CRS Report RL33064, *Organization and Mission of the Emergency Preparedness and Response Directorate: Issues and Options for the 109th Congress*, by Keith Bea.

²² ATSDR is required to conduct various activities under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or "Superfund") and subsequent amendments, and the Resource Conservation and Recovery Act of 1976. See <http://www.atsdr.cdc.gov/congress.html> and CRS Report RL31154, *Superfund: A Summary of the Law*, by Mark Reisch.

²³ See ATSDR, "Health Consultation: Murphy Oil Spill," Dec. 9, 2005, at <http://www.bt.cdc.gov/disasters/hurricanes/>.

Centers for Disease Control and Prevention

The CDC launched a website to provide public health information in the aftermath of Hurricane Katrina.²⁴ The site includes a variety of fact sheets and other information for health professionals, response and cleanup workers, evacuation center staff, school officials, state grantees and the general public. In addition, the site provided regular updates from the CDC Director's EOC through October 7.²⁵ Once activated, the EOC was the point of contact for state health departments, other CDC grantees, and other interested parties to request assistance or to provide the agency with new or updated information about public health concerns on the ground.

CDC deployed several hundred of its staff to affected states, including individuals in the following specialties: medicine, epidemiology, sanitation, environmental health, assessment, disease surveillance, public information and health risk communication. In addition, the agency deployed more than 600 staff to its EOC response. The agency also deployed the Strategic National Stockpile of drugs and medical supplies to affected states. Among the specific supplies delivered for this disaster were: 1) many thousands of doses of vaccines for tetanus/diphtheria, and hepatitis A and B; 2) vials of insulin; 3) prescription pain medications; and 4) ventilator kits.

The agency also made numerous public health recommendations to address the anticipated and atypical threats posed by Hurricane Katrina and its aftermath. CDC made several specific recommendations for infectious disease control, including the immunization of emergency responders, relief workers and evacuees. The agency expressed particular concern about the risks of tetanus from wounds, and of influenza, measles, chickenpox and hepatitis A in crowded conditions, especially if some children may not have had current immunizations.²⁶ CDC also alerted health officials and others to cases of *Vibrio* infection in hurricane victims, which caused 22 illnesses, five of them fatal.²⁷ *Vibrio*, a bacterial pathogen found in salty and brackish waters, can cause foodborne illness or severe wound infection. CDC made an effort to alert health workers to this unusual hazard because *Vibrio* infections are especially severe, leading to loss of an affected limb or death within a matter of days, sometimes despite aggressive treatment.

On September 17, CDC and the Environmental Protection Agency (EPA) issued a joint report of their initial assessment of environmental health and infrastructure hazards in New Orleans, to assist state and local officials in planning for reoccupation of the city.²⁸ FEMA requested CDC assistance in evaluating any potential health effects of housing displaced persons in trailers sited on former agricultural fields. The agency has also evaluated the potential health threat posed by exposure to mold,²⁹ and provided assistance in the federal environmental cleanup effort.³⁰

Responders may be at increased risk from certain hazards in the aftermath of disasters. CDC's National Institute for Occupational Safety and Health (NIOSH) developed resources for

²⁴ See <http://www.bt.cdc.gov/disasters/hurricanes/index.asp>.

²⁵ See <http://www.cdc.gov/od/katrina/>.

²⁶ See CDC, "Immunization Information for Hurricane Katrina," at <http://www.bt.cdc.gov/disasters/hurricanes/immunizations.asp>.

²⁷ CDC, "Vibrio Illnesses After Hurricane Katrina—Multiple States, August-September 2005," *MMWR*, vol. 54/(37), p. 928-931, Sept. 23, 2005.

²⁸ CDC and EPA, "Hurricane Katrina: Environmental Health Needs & Habitability Assessment," Sept. 17, 2005, at <http://www.bt.cdc.gov/disasters/hurricanes/katrina/envassessment.asp>.

²⁹ See CDC, "Environmental Concerns after Hurricane Katrina," at <http://www.bt.cdc.gov/disasters/hurricanes/environmental.asp>.

³⁰ See CRS Report RL33115, *Cleanup after Hurricane Katrina: Environmental Considerations*, by Robert Esworthy, Linda Jo Schierow, Claudia Copeland, and Linda Luther.

occupational safety and health for responders, and in hospitals, health departments, and shelters involved in the response to Hurricane Katrina.³¹

Food and Drug Administration

In the aftermath of Hurricane Katrina, the Food and Drug Administration (FDA) issued numerous recommendations regarding the handling of drugs, biologics and medical devices that may have been harmed by exposure to floodwaters or loss of refrigeration. The agency also issued guidance in ensuring the safety of food, and participated in evaluations of the safety of fish and shellfish in affected Gulf Coast waters.³²

The Medical Response

Overview

The medical response to a disaster may be more challenging than the public health response. Most public health activities are inherently governmental and involve agencies that work together regularly, though often at different levels of government. Medical response capabilities, in contrast, span a wide array of sectors, both public and private, and involve more non-traditional partnerships such as the coordination of DHS and Department of Defense (DOD) activities by HHS. A successful medical response to a disaster requires the coordination of six elements: patients in need; a site where care is provided; the needed drugs, supplies and equipment; a provider workforce; a system of record keeping; and a financing mechanism.

Though national disaster planning has long anticipated the need to respond to a mass casualty incident, such a situation, with overwhelming numbers of non-fatal illness and injury victims, has not happened recently in the United States. While certain recent events (e.g., the September 11, 2001 attack and some jetliner crashes) have tested the national system for mass fatality management, Hurricane Katrina is the only event in recent times that has caused non-fatal mass casualties of a scope that could not easily be absorbed into the existing healthcare system. Scrutiny of the response to this challenge is ongoing.

As discussed earlier, federal leadership for medical emergency response is based in HHS per its coordinating responsibility under NRP ESF#8. Numerous medical response programs and activities reside in HHS agencies within the Public Health Service (PHS). In addition, the Commissioned Corps of the PHS, headed by the Surgeon General, is composed of many healthcare professionals who are expected to maintain current skills and deploy to support emergency responses when needed.³³ Another critical medical response asset, the National Disaster Medical System (NDMS) was transferred from HHS to DHS in March 2003. Additional critical assets such as personnel, bed capacity, equipment and patient transport capability are based in the Departments of Defense and Veterans Affairs, as well as the private sector.

Medical and Healthcare Challenges

Hurricane Katrina posed a number of challenges to the healthcare system, many without recent precedent. Physical access to healthcare facilities was hampered across the Gulf Coast following

³¹ See CDC NIOSH, <http://www.cdc.gov/niosh/topics/flood/#new>.

³² See <http://www.fda.gov/oc/opacom/hottopics/hurricane.html>.

³³ See the HHS Office of the Surgeon General at <http://www.surgeongeneral.gov/> and the U.S. Public Health Service Office of Force Readiness and Deployment at <http://oep.osophs.dhhs.gov/ccrf/>.

the storm, and many facilities sustained primary damage. Several facilities that did not evacuate prior to the storm found their patients in dire circumstances when rising floodwaters made it progressively more difficult to maintain standards of care. Individuals with pre-existing health conditions worsened as they were cut off from access to essential medications and treatments such as oxygen, insulin, or kidney dialysis. In some flooded areas, access to fresh water was so scarce that victims and their caregivers suffered from dehydration. In the wake of large-scale evacuations of New Orleans beginning on September 1, victims from shelters and from failing healthcare facilities were evacuated to a temporary field hospital at the New Orleans airport, where medical response teams, initially overwhelmed, conducted triage and prioritized victims for airlift to available healthcare facilities outside the flood zone. Meanwhile, medical workers continued their efforts to reach numerous isolated communities along the Mississippi and Louisiana coast. Morgues were set up in Louisiana and Mississippi to house and identify the dead.

In the wake of the catastrophe, victims were sent for treatment to numerous permanent and temporary healthcare facilities across a wide area of the south central United States, often becoming separated from their loved ones and important medications and medical records along the way. Public health emergencies were declared in nine states that did not suffer primary impacts from Hurricane Katrina but that became hosts to large numbers of evacuees needing care. Healthcare facilities sought assistance in covering the costs of care for those who were previously or newly uninsured.

The short-and long-term mental health needs of victims and responders had to be assessed. Immediate problems such as Post-Traumatic Stress Disorder receive considerable popular attention, but some evidence shows that victims of catastrophic disasters may continue to suffer from major depression and other disorders for several years. Mental health services following disasters must also account for pre-existing mental health and substance abuse problems in some victims.

Selected HHS Agency Actions

Centers for Medicare and Medicaid Services

The Centers for Medicare and Medicaid Services (CMS), which administers the Medicare, Medicaid and SCHIP programs, took several actions to streamline access to healthcare for those displaced by Hurricanes Katrina and Rita. Many evacuees crossed state lines without proper documentation of program eligibility. HHS Secretary Leavitt exercised certain authorities under Sections 1115 and 1135 of the Social Security Act and waived several program requirements, in order to assist displaced victims and their providers.³⁴

Health Resources and Services Administration

The Health Resources and Services Administration (HRSA) provides grants to Federally Qualified Health Centers, Ryan White HIV/AIDS outpatient providers and some other providers and clinics that offer health services to underserved populations. HRSA administers several relevant programs in emergency preparedness. One is a grant program for state and local hospital preparedness for public health emergencies, which is meant to help states identify and coordinate

³⁴ See CRS Report RL33083, *Hurricane Katrina: Medicaid Issues*, by Evelyne Baumrucker, April Grady, Jean Hearne, Elicia Herz, Richard Rimkunas, Julie Stone, and Karen Tritz.

hospital bed capacity, personnel and medical supplies in an emergency. Another is a program for the advance registration of volunteer health professionals.³⁵ The latter program is discussed in a subsequent section on *Issues for Congress*.

HRSA undertook a number of response efforts following Hurricane Katrina, including staff deployments.³⁶ On September 9, HHS Secretary Leavitt announced that HRSA would advance approximately \$2.3 million in FY2005 funds to establish 26 new health center sites in areas impacted by Hurricane Katrina.³⁷ The agency issued a notice clarifying that providers who normally provided services under the liability protections of federal employment in certain HRSA-supported health centers would continue to receive protection while serving at temporary locations established in response to the hurricane. In addition, in affected areas, the agency offered expedited procedures for designating Health Professions Shortage Areas, and for reviewing loan repayment applications for National Health Service Corps personnel.

National Institutes of Health

The National Institutes of Health (NIH) set up a phone-based medical consultation service for providers treating victims or evacuees from the Hurricane Katrina disaster, which it operated through September 2005. The agency also identified hospital bed capacity within its medical system, among other activities.³⁸ The National Institute of Environmental Health Sciences developed an interactive Geographic Information System (GIS) for Texas, Louisiana and Mississippi to help model the movement of contaminants and identify sources of human exposure.³⁹

Substance Abuse and Mental Health Services Administration⁴⁰

The Substance Abuse and Mental Health Services Administration (SAMHSA) has as its mission to build resilience and facilitate recovery for people with or at risk for substance abuse and mental illness. SAMHSA's Center for Mental Health Services (CMHS) focused on providing resources to aid in the recovery process following Hurricanes Katrina and Rita, and established a toll-free hotline for people in crisis in the aftermath of this disaster.⁴¹

SAMHSA has three main mechanisms to provide funding to address disaster victims' mental health needs: 1) the Crisis Counseling Assistance and Training program (CCP), 2) SAMHSA Emergency Response Grants (SERG), and 3) supplemental appropriations. The CCP is administered by SAMHSA through an interagency agreement with FEMA. Eligible entities (state mental health agencies and tribal authorities) work with SAMHSA to apply for and receive grants for counseling outreach and training local crisis counselors to provide assistance after federal

³⁵ For more information, see CRS Report RL31719, *An Overview of the U.S. Public Health System in the Context of Emergency Preparedness*, by Sarah A. Lister, and <http://www.hrsa.gov/bioterrorism/index.htm>.

³⁶ See HRSA, "Hurricane Katrina Relief and Recovery," at <http://www.hrsa.gov/katrina/>.

³⁷ HHS, "Secretary Leavitt Announces Advance of Health Center Funds to Hurry Services to Hurricane-Affected Areas," press release, Sept. 9, 2005.

³⁸ See <http://www.nih.gov/about/director/hurricanekatrina/index.htm>.

³⁹ See <http://www-apps.niehs.nih.gov/katrina/>.

⁴⁰ For further information see CRS Report RS22292, *Hurricanes Katrina & Rita: Addressing the Victims' Mental Health and Substance Abuse Treatment Needs*, by Erin D. Williams

⁴¹ See SAMHSA, "Hurricane Katrina and Disaster Relief Information," at <http://www.mentalhealth.samhsa.gov/cmhs/katrina/>, and HHS, "HHS Awards \$600,000 in Emergency Mental Health Grants to Four States Devastated by Hurricane Katrina," news release, Sept. 13, 2005.

relief workers leave the area. SERG are available when local resources are overwhelmed and other resources are unavailable. SAMHSA may provide SERG for crisis mental health and substance abuse services in accordance with SAMHSA's Mental Health and Substance Abuse Emergency Response Criteria.⁴² Supplemental appropriations may be used by SAMHSA for emergency mental health and substance abuse counseling and related services not addressed by the CCP, the SERG, or other existing funding. These may include, for example, substance abuse and mental health treatment services, psychotropic medication expenses, methadone treatment, suicide prevention programs, and major administrative expenses for mental health and substance abuse resulting from the disaster.

Department of Homeland Security

National Disaster Medical System

The National Disaster Medical System (NDMS) was established in HHS in 1984 to provide medical and ancillary services when a disaster overwhelms local emergency services.⁴³ NDMS was most recently reauthorized through 2006 in the Public Health Security and Bioterrorism Preparedness and Response Act (P.L. 107-188),⁴⁴ and was transferred to DHS in the Homeland Security Act (P.L. 107-296) effective in March 2003.⁴⁵ NDMS is administered by FEMA and is a partnership of HHS, DHS, the Departments of Defense and Veterans Affairs, state and local governments, and the private sector.

NDMS consists of a number of response teams that can deploy to a scene rapidly and set up field operations that are self-sustaining for up to 72 hours, until additional federal support arrives. NDMS also provides for transportation of large numbers of casualties from an impacted site to distant locations for care. There are several types of NDMS teams, which are typically comprised of 20-35 individuals. Team members train as a group between deployments, under a defined team commander, and are versed in incident command and other emergency management protocols in addition to their disaster medicine skills. NDMS teams can be requested by the Secretary of HHS pursuant to NRP ESF#8. Medical professionals on the teams must be licensed to practice in at least one U.S. jurisdiction and are not generally federal employees unless deployed, at which time they are considered federalized for liability and compensation purposes. On September 9, 2005, FEMA reported that it had deployed more than 87 NDMS teams in response to Hurricane Katrina. Information about specific deployment activities follows.

Disaster Medical Assistance Teams (DMATs) are teams of physicians, nurses and other medical professionals who provide medical care. FEMA reported that it deployed all of the nation's more than 50 DMATs in the initial response to Hurricane Katrina. At least one team was predeployed to the New Orleans Superdome shelter.⁴⁶ The Louis Armstrong International Airport outside New Orleans served as a temporary field hospital for hurricane victims as they were evacuated from the city. DMAT members from a dozen teams deployed at the airport reported overwhelming

⁴² See <http://www.fema.gov/library/stafact.shtml#sec416>, and 66 FR 51873, Oct. 11, 2001.

⁴³ See the NDMS home page at <http://www.ndms.dhhs.gov/>, and Jerry L. Mothershead et al., "Bioterrorism Preparedness III: State and Federal Programs and Response," *Emergency Medicine Clinics of North America*, vol. 20, 2002, pp. 477-500.

⁴⁴ 42 U.S.C. §300hh.

⁴⁵ 6 U.S.C §312 et seq.

⁴⁶ Jeff Jones, "N.M. Team Has Praise for Superdome: Medical Staff Says Stadium Saved Katrina Victims' Lives," *Albuquerque Journal*, Sept. 8, 2005.

numbers of patients, some of whom could not be saved under the austere conditions they faced. Teams fanned out across the affected Gulf Coast, doing what they could to accommodate victims of the hurricane which, by some reports, also robbed the region of 6,000 hospital beds.⁴⁷

Disaster Mortuary Operational Response Teams (DMORTs) are composed of medical examiners, coroners, pathologists, forensic dentists, radiologists, mental health counselors, funeral directors and support personnel. Teams typically consist of 26 members. They assist in handling the dead and conducting two types of investigations in mass fatality incidents: disaster victim identification (DVI) and death investigation. DVI involves the identification of victims, in order that their loved ones can have documentation of their deaths, claim the remains, and carry out funeral rites. It is considered an essential responsibility of governments in assisting survivors in their recovery. Death investigation involves establishing the cause, time and other circumstances of death. These investigations are conducted under the authority of state or local medical examiners, with assistance from DMORT personnel and federal funding through FEMA. DMORT sites were set up in Gabriel, Louisiana, and Gulfport, Mississippi, each site with four DMORT teams and one portable morgue.⁴⁸

Veterinary Medical Assistance Teams (VMATs) are composed of veterinarians, technicians and support personnel who provide animal rescues, health assessments and other services during a disaster. Following Hurricane Katrina, all four VMAT teams were deployed to the Gulf Coast to provide care for displaced companion animals and support for damaged or destroyed veterinary practices.⁴⁹

NDMS also supports *National Pharmacy Response Teams* of pharmacists, pharmacy technicians, and students of pharmacy who assist in mass-dispensing of medications during disasters, and *National Nurse Response Teams* to assist if a disaster such as a bioterrorism event were to require a mass prophylaxis or mass vaccination campaign, or if the healthcare workforce is otherwise overwhelmed.

Federal Coordinating Centers (FCCs) are based in the Departments of Defense (DOD) and Veterans Affairs (VA), where they identify available nationwide hospital bed capacity in civilian and military hospitals, and coordinate planning and distribution of patients evacuated from a disaster area.⁵⁰

Since NDMS deploys in situations other than disasters (e.g., National Special Security Events such as political conventions) and much of its work is, therefore, not eligible for reimbursement from the DRF, the program has a regular annual appropriation. NDMS is funded through the Public Health Programs account under the DHS Preparedness and Response title, and received \$34 million in FY2005 and in FY2006.⁵¹ On September 8, the President signed the second

⁴⁷ Anne Jungen, "DMAT Member: New Orleans Airport Was Like 'Third World,'" *Erie Times-News, Pa. Knight Ridder/Tribune Business News*, Sept. 9, 2005; and Ceci Connolly, "Improvising to Replace Services for Many Thousands," *Washington Post*, Sept. 6, 2005.

⁴⁸ FEMA, "Medical Assistance and Supplies Flow into Hurricane-Hit Areas," press release number HQ-05-205, Sept. 5, 2005; Alan Levin, "Morgue Units Preparing as Katrina's Dead Uncovered," *USA Today*, Sept. 8, 2005; and Darryl E. Owens, "Katrina's Aftermath, Helping the Dead Reclaim Identity," *Orlando Sentinel*, Sept. 9, 2005.

⁴⁹ See Susan C. Kahler and R. Scott Nolen, "AVMA Mounts Preparedness, Response to Katrina," *Journal of the American Veterinary Medical Association*, Sept. 13, 2005, at <http://www.avma.org/onlnews/javma/oct05/x051001b.asp>, and VMAT Team situation reports at http://www.avma.org/disaster/situation_reports/default.asp.

⁵⁰ See NDMS FCC page at <http://ndms.dhhs.gov/fcc.html>.

⁵¹ See Table 8 in CRS Report RL32863, *Homeland Security Department: FY2006 Appropriations*, by Jennifer E. Lake and Blas Nuñez-Neto.

emergency supplemental appropriation for Hurricane Katrina relief (P.L. 109-62), which authorized the transfer of up to \$100 million from the DRF to maintain Katrina-related NDMS response operations. In its weekly report to Congress on Hurricane Katrina expenditures, FEMA reported that it had transferred the entire amount.⁵²

Department of Defense

During a presidentially-declared disaster and pursuant to the NRP, the DOD assists the Secretary of HHS with numerous ESF#8 responsibilities. These include evacuating patients, locating or providing hospital beds, additional personnel and supplies, and providing specialized laboratory testing and other technical assistance.⁵³

On September 13, DHS reported that DOD had: 1) 789 beds available in field hospitals at Louis Armstrong New Orleans International Airport in New Orleans, the 14th Combat Support Hospital, and aboard USS Bataan, USS Iwo Jima, USS Tortuga and USS Shreveport; and 2) 20 Navy ships on station in the region to provide medical support, humanitarian relief, and transportation.⁵⁴

Department of Veterans Affairs

During a presidentially-declared disaster and pursuant to the NRP, the Department of Veterans Affairs (VA) assists the Secretary of HHS with numerous ESF#8 responsibilities. These include coordinating available hospital beds, additional personnel and supplies, and providing technical assistance.⁵⁵

The VA evacuated veterans from two of its own medical centers impacted by Hurricane Katrina, one in Biloxi, Mississippi, which was evacuated prior to landfall and demolished by the storm, and the other in New Orleans, which was evacuated after the city was flooded. The VA also activated 17 of its NDMS Federal Coordinating Centers to coordinate the relocation of evacuated veterans, as well as of civilian patients who were evacuated from permanent and temporary hospitals in storm-ravaged areas⁵⁶

Issues for Congress

All-Hazards Preparedness

In the aftermath of Hurricane Katrina there were concerns that federal readiness for the disaster had been hampered by an overemphasis on planning for terrorism at the expense of planning for natural disasters. A similar debate exists for public health preparedness, namely how the balance should be struck between *all-hazards* preparedness versus readiness for specific threats such as a cyanide attack or pandemic influenza. In comprehensive bioterrorism preparedness legislation after the 2001 terror attacks, Congress authorized grants to states to “address the following

⁵² DHS/ FEMA, Weekly Report on Hurricane Katrina Allocations, Commitments, and Obligations, Sept. 22, 2005.

⁵³ See NRP ESF Annex #8, Public Health and Medical Services, p. 9.

⁵⁴ See DHS, “What Government Is Doing,” press release, Sept. 13, 2005; and DOD website on Katrina relief efforts at <http://www.dod.mil/home/features/2005/katrina/news/>.

⁵⁵ See NRP ESF Annex #8, Public Health and Medical Services, p. 12.

⁵⁶ VA Under Secretary for Health Jonathan B. Perlin, briefing to congressional staff on Hurricane Katrina response, Sept. 8, 2005. See also CRS Report RS22279, *Hurricane Katrina and Veterans*, by Sidath Viranga Panangala.

hazards in the following priority: (i) Bioterrorism or acute outbreaks of infectious diseases (and) (ii) Other public health threats and emergencies.”⁵⁷ Discussions have followed about whether a focus on terrorism (e.g., the civilian smallpox vaccination program) has hampered preparedness for other threats, or, on the other hand, whether flexible all-hazards grant guidance has failed to assure state preparedness for some specific threats (e.g., a cyanide or plague attack).⁵⁸

Some reports suggest that the public health response to Hurricane Katrina was streamlined by some all-hazards improvements made since 2001. For example, when the Louisiana state public health laboratory in New Orleans was disabled by the storm, operations were quickly diverted to branch public health laboratories in Shreveport, Lake Charles and Amite, or to other states as needed.⁵⁹ The swift response was facilitated by inter-state electronic communications systems and relationships that had been established since 2001.

Upon completing their missions, disaster response personnel are typically required to report to supervisors on their activities. These *after-action reports* are expected to be prepared and submitted to a variety of agencies involved in the response to Hurricane Katrina. As after-action reports become available, Congress may review the public health and medical response to Hurricane Katrina to determine how well it met the goals Congress laid out for achieving a flexible, efficient national system for response to health emergencies. Part of this review may be the consideration of the process of developing standards for federal, state and local public health preparedness, a process which has proven difficult in the past.

Coordinated Needs Assessments

Needs assessments are considered critical in the response to catastrophic disasters. When it is likely that response assets will be overwhelmed, lives may be saved by prioritizing the response as effectively as possible (e.g., matching the deployment of NDMS teams as well as possible to defined areas of medical need). However, the response to public health and medical needs may have to be delayed until response has been made to other problems such as civil disorder or a lack of physical access. Therefore, coordinating the assessments across all sectors is essential.

Following a disaster, the NRP calls for the early deployment of *Emergency Response Teams for Assessment* (ERT-A), which are FEMA-led teams that work with state Emergency Operations Centers (EOCs) and others to conduct initial and ongoing impact assessments. Early assessments define the extent of problems such as flooding, the integrity of roads and bridges, and damage to the electricity grid. Representatives from selected ESF support agencies are to be included in ERT-A deployments. The ERT-A teams are to report back to an Interagency Incident Management Group (IIMG), which is tasked to report to the Secretary of DHS with recommendations for those areas in most critical need of response assets and activities.⁶⁰

The CDC manages a program in Disaster Epidemiology and Assessment, which includes development of a *disaster rapid needs assessment* tool designed to quickly provide emergency managers with reliable information about potential public health threats.⁶¹ The CDC has

⁵⁷ 42 U.S.C. §247d-3a.

⁵⁸ For further discussion, see CRS Report RL31719, *An Overview of the U.S. Public Health System in the Context of Emergency Preparedness*, by Sarah A. Lister, section on “Issues for Congress: Overview.”

⁵⁹ Announcement from the Louisiana Office of Public Health, “Public Health Laboratory Capacity in Louisiana After Hurricanes Katrina and Rita,” updated Oct. 17, 2005, at <http://www.bt.cdc.gov/disasters/hurricanes/katrina/lalabcapacity.asp>.

⁶⁰ NRP, p. 40.

⁶¹ See CDC Disaster Epidemiology and Assessment home page at <http://www.cdc.gov/nceh/hsb/disaster/>

conducted these assessments for several domestic and foreign disasters, including Hurricane Katrina.⁶² The tool is not designed for the rapid assessment of medical or mental health needs. CDC has reported on longer-term assessments of medical and mental health needs in areas affected by Hurricanes Katrina and Rita, and on surveillance systems, set up in evacuee shelters, that allowed for the measurement of the burden of certain chronic diseases such as diabetes and mental illness.⁶³ Further review of this information will inform efforts to improve the tools used for needs assessment, though it is not known whether there are efforts underway to develop a process specifically for the rapid assessment of medical and mental health needs in the immediate aftermath of a disaster.

Policy issues may include the performance of the FEMA ERT-A process in supporting the more specific goals of assessing public health, medical and mental health needs following Hurricane Katrina, and, indeed, whether an effective process of medical and mental health needs assessment exists. In particular, are the federal mechanisms to support rapid public health, medical and mental health needs assessments in place and adequate to support a capable national response? Also, are these processes integrated well within the larger FEMA-led process of overall assessment, in order that appropriate public health, medical and mental health responses can reach their targets quickly and efficiently?

Disaster Planning in Healthcare

Overview

Following Hurricane Katrina, there were numerous reports of problems experienced by fragile or medically needy persons. These problems included 1) drownings and dehydration in facilities that did not evacuate and were flooded by the hurricane storm surge; 2) emergency evacuations of deteriorating patients from hospitals that were unable to care for patients after power, water and food had been cut off for several days; and, 3) chronic conditions exacerbated by the loss of access to needed care such as insulin, oxygen therapy or kidney dialysis. In preparing for Hurricane Rita, authorities in many communities on the Texas and Louisiana coast paid particular attention to identifying and helping those with special health needs, providing public transportation to support the evacuation of nursing homes and those receiving other health services.

Hurricane Katrina also exposed a number of problems that healthcare facilities experienced as a result of the scope of the disaster. The failure of communications systems across the Gulf Coast made it difficult for facilities to seek assistance, or for emergency responders to know that a facility was in need. In addition, since all facilities were simultaneously affected, the use of shared resources (“double-counting”) led to problems. For example, single ambulance companies had contracted to evacuate multiple facilities. This arrangement, which would work well if facilities had been affected in isolation, was untenable in a wide scale disaster.

Following the hurricanes, experts have stressed the need for coordinated disaster planning in healthcare. They note that in addition to assuring that facilities are well prepared on their own, they must be integrated into community-wide emergency management activities. Further,

surveillance.htm.

⁶² CDC, “Hurricane Katrina Response and Guidance for Health-Care Providers, Relief Workers, and Shelter Operators,” *MMWR*, 54(35), p. 877, Sept. 9, 2005.

⁶³ CDC: “Assessment of Health-Related Needs After Hurricanes Katrina and Rita—Orleans and Jefferson Parishes, New Orleans Area, Louisiana, October 17-22, 2005,” *MMWR*, vol. 55(2), pp. 38-41; and, “Surveillance in Hurricane Evacuation Centers—Louisiana, September - October 2005,” *MMWR*, vol. 55(2), pp. 32-35, Jan. 20, 2006.

identifying vulnerable non-institutionalized populations and assuring their care before, during and after a disaster also requires a community-wide coordinated approach.

Regulation of Institutions and Services

Healthcare facilities (e.g., hospitals and nursing homes) are regulated by state and local authorities, with varying degrees of federal involvement. Regulations provide an opportunity for oversight of two critical disaster planning functions: *evacuation* and *continuity of operations*. (In this context, continuity of operations, the ability to sustain life-saving operations in the absence of power, water and other external supplies, could also be considered *sheltering in place*.) Given the nature of their business, hospitals are generally able to continue operations in the face of power outages, at least temporarily, because they employ generators to maintain critical life-support functions in an emergency. Furthermore, it is difficult to evacuate hospital or nursing home patients as their special needs may require special transport and host facilities. This may motivate better preparedness for continuity of operation as a more feasible option than evacuation. Healthcare facilities should be able to do both, though, as different types of disasters would require one or the other response. Hospitals in New Orleans that initially chose to continue operations ultimately had to evacuate.

Evacuation policies and regulations for healthcare facilities have long focused on fire safety, for which the need to evacuate is evident, and for which drills are regularly conducted by local fire safety authorities. Evacuation planning for a predicted threat such as a hurricane may be more challenging. The decision to evacuate or not may hinge on emergency management rather than healthcare expertise, and may be guided by local officials rather than facility managers. For example, the mandatory evacuation order issued by the city of New Orleans on August 28 excluded “essential personnel of hospitals and their patients,” but did not exempt other types of healthcare facilities.⁶⁴ In preparing for Hurricane Charley in Florida in 2004, one county issued a countywide mandatory evacuation order, while a neighboring county issued a mandatory order for nursing homes only.⁶⁵

While healthcare facilities are licensed and regulated by state and local authorities, there is a role for federal oversight of their disaster preparedness and response capabilities through standards developed by the Occupational Safety and Health Administration (OSHA) and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), as well as through conditions of participation (CoPs) for Medicare and Medicaid.⁶⁶ Following Hurricane Katrina, a JCAHO witness testified that the commission certifies 85% of U.S. hospitals encompassing 96% of hospital beds.⁶⁷ JCAHO-certified hospitals are deemed by federal law as meeting the conditions of participation for Medicare and Medicaid reimbursement. The commission’s 2005 accreditation manual for hospitals includes standards regarding emergency management, in

⁶⁴ Civil District Court for the Parish of New Orleans, State of Louisiana, City of New Orleans, “Promulgation of Emergency Orders,” undated document, at <http://www2a.cdc.gov/phlp/docs/NewOrleansEmergencyOrders.pdf>.

⁶⁵ CDC, “Epidemiologic Assessment of the Impact of Four Hurricanes—Florida, 2004,” *MMWR*, 54(28), pp. 693-697, July 22, 2005.

⁶⁶ See “Evacuation Strategies for Disaster Planning,” *Healthcare Hazard Management Monitor*, vol. 15, no. 8, Apr. 2002; and 42 C.F.R. §482 through §485.

⁶⁷ Testimony of Joseph Capiello for JCAHO, hearing before the House Committee on Energy and Commerce, Subcommittees on Health and on Oversight and Investigations, on “Assessing Public Health and the Delivery of Care in the Wake of Hurricane Katrina,” Sept. 22, 2005, 109th Congress, 1st sess., Washington, D.C., hereafter called JCAHO testimony.

addition to standards addressing certain specific threats such as fire and hazardous materials.⁶⁸ The Government Accountability Office (GAO) has reported concerns regarding enforcement of JCAHO certification standards.⁶⁹

While JCAHO has certification programs for other types of healthcare institutions besides hospitals, some of the programs are voluntary or do not cover a majority of the relevant industry. Conditions of participation for Medicare and Medicaid reimbursement for other institutions, as well as for various non-institutional services (e.g., home-based care), vary in the degree to which disaster planning is addressed. The role of state and local authorities in assuring disaster preparedness for these facilities and services appears to dominate.

Community-based Disaster Planning

In Congressional testimony following Hurricane Katrina, a JCAHO witness stressed the need for hospitals to prepare for disasters within a community-wide structure, not in isolation.⁷⁰ The commission's 2005 emergency management standards include a requirement that hospitals conduct a "hazard vulnerability analysis" to determine the types of hazards the facility is likely to face. There are also several standards requiring that hospitals have and test emergency backup systems for electricity and other utilities. Careful planning of this type could prevent planning errors such as the placement of back-up generators in the basement of a flood-prone facility. In addition, hospitals are required to coordinate various planning tasks with local emergency management authorities.

Problems in delivering care to the chronically ill after hurricanes were described in reports following four hurricanes in Florida in 2004.⁷¹ The emphasis of disaster planning for non-institutional services is based on assuring continuity of care during and after a disaster. Some communities have developed programs to identify vulnerable individuals and assure continuity of care. The massive dislocation of the victims of Hurricane Katrina demonstrates how challenging this task can be.

Following the terror attacks in 2001, Congress created a national program of grants to states to improve the ability of communities to respond to emergencies that cause mass casualties.⁷² The National Bioterrorism Hospital Preparedness Program is administered by the Health Resources and Services Administration (HRSA).⁷³ Grants are awarded to state health officials to develop coordinated state and regional mass casualty plans. Though grant guidance directs that a majority of funds be passed through to healthcare institutions, the program is not designed to assure preparedness for each facility or service in a state. It could be a means, however, for states to develop reliable communications systems between hospitals and emergency management

⁶⁸ JCAHO, "Management of the Environment of Care," *Comprehensive Accreditation Manual for Hospitals*, 2005.

⁶⁹ GAO, "CMS Needs Additional Authority to Adequately Oversee Patient Safety in Hospitals," GAO-04-850, July 2004.

⁷⁰ JCAHO testimony.

⁷¹ See, for example: CDC, "Epidemiologic Assessment of the Impact of Four Hurricanes—Florida, 2004," *MMWR* 54(28), pp. 693-697, July 22, 2005; and CDC, "Rapid Assessment of the Needs and Health Status of Older Adults After Hurricane Charley—Charlotte, DeSoto, and Hardee Counties, Florida, August 27—31, 2004," *MMWR* 53(36), pp. 837-840, Sept. 17, 2004.

⁷² 42 U.S.C. 247d-3a.

⁷³ For more information, see CRS Report RL31719, *An Overview of the U.S. Public Health System in the Context of Emergency Preparedness*, by Sarah A. Lister.

authorities, or to address other aspects of coordination. There is limited publicly available information on how states have used hospital preparedness grant funds.

Promising Practices

Some states and communities with disaster experience have come up with approaches to address problems of disaster planning in healthcare.⁷⁴ For example, Florida has a requirement (in statute and regulation) that home health agencies include in patients' records individual disaster plans (e.g., an individual evacuation plan) that have been discussed with the patient and the patient's caregivers.⁷⁵ Florida also established *Special Needs Shelters* for vulnerable persons during the 2004 hurricanes. The state facilitated evacuation to the shelters of individuals who were pre-identified by county health departments. This arrangement facilitated care of those whose needs were not so great that they required hospitalization, but that nonetheless exceeded the expertise available in Red Cross and other community shelters.⁷⁶

In New York City, the Office of Emergency Management serves as the focal point of coordination for the Department of Aging and other city agencies to identify and plan for the care of special-needs populations during a disaster. Individuals are pre-identified from certain databases such as home-delivered and group meals programs and the electric utility's list of clients who are on life support equipment. The Greater New York Hospital Association has testified on the value of redundant communications systems that were established in city hospitals and the Office of Emergency Management prior to the northeast blackout in 2003.⁷⁷

Options for Congress

Congress could decide to look specifically at whether the federal requirements for facility disaster and evacuation plans are adequate, and adequately enforced. If it did so, it might consider options to improve general emergency preparedness in healthcare facilities, including the elements of planning, staffing, training, stockpiling of supplies, evacuation procedures, and coordination with emergency management authorities. In addition, the role of the HRSA hospital preparedness grant program as a mechanism for coordinated disaster planning in healthcare could be examined.

National Disaster Medical System

As previously discussed, the NDMS was created in the 1980s under the U.S. Public Health Service in HHS, and was transferred to DHS under FEMA in the 2003. The cited intent of this transfer, proposed by the Administration, was to assure a coordinated federal response to terrorism and other disasters. The Government Accountability Office (GAO) supported the transfer.⁷⁸ But since then, a review of DHS medical response capabilities, conducted at the request

⁷⁴ See Senate Committee on Aging, hearing on "Preparing Early, Acting Quickly: Meeting the Needs of Older Americans During a Disaster," Oct. 5, 2005, 109th Congress, 1st sess., Washington, D.C.

⁷⁵ State of Florida, "Provision of Services During an Emergency," State Health Care Law 400.492.

⁷⁶ Association of State and Territorial Health Officials, "Special Needs Shelters Are Key Component of the Public Health Response to the 2004 Hurricanes," fact sheet, undated, at <http://www.astho.org/pubs/SpecialNeeds.pdf>.

⁷⁷ Testimony of the Greater New York Hospital Association before the New York City Council, Committee on Health, regarding "New York City Hospitals in the Blackout of 2003: Lessons Learned," Sept. 29, 2003, at <http://www.gnyha.org/testimony/>.

⁷⁸ Government Accountability Office, *Homeland Security: New Department Could Improve Coordination but Transferring Control of Certain Public Health Programs Raises Concerns*, GAO-02-954T, July 16, 2002. At the time of publication, the agency was called the General Accounting Office.

of then-Secretary Tom Ridge in 2004, found “... that the nation’s medical leadership works in isolation, its medical response capability is fragmented and ill-prepared to deal with a mass casualty event and that DHS lacks an adequate medical support capability for its field operating units.”⁷⁹ Further, some NDMS team members have complained that the program has not received adequate administrative support under FEMA.⁸⁰ Two organizational issues may be relevant to this concern.

First, some NDMS team members have stated that their mission—to provide direct medical services—is not understood by FEMA management.⁸¹ The Lowell report had recommended the appointment of a DHS Assistant Secretary for Medical Readiness to address this concern.⁸² In July 2005, DHS Secretary Michael Chertoff announced his proposal to reorganize DHS following a comprehensive review, which became known as the “Second Stage Review” or 2SR.⁸³ Chertoff announced that he proposed to split the existing Emergency Preparedness and Response Directorate (which housed FEMA and NDMS) into two separate directorates, for distinct activities in preparedness and response, respectively. He announced the appointment of a chief medical officer (CMO), a position that had not previously existed in DHS, within the proposed preparedness directorate, as follows:

...as part of our consolidated preparedness team, I will appoint a chief medical officer within the preparedness directorate. This position will be filled by an outstanding physician who will be my principal advisor on medical preparedness and a high-level DHS representative to coordinate with our partners at the Department of Health and Human Services, the Department of Agriculture and state governments.

The chief medical officer and his team will have primary responsibility for working with HHS, Agriculture and other departments in completing comprehensive plans for executing our responsibilities to prevent and mitigate biologically-based attacks on human health or on our food supply.⁸⁴

The following day, Chertoff announced the appointment of Dr. Jeffrey Runge to the post.⁸⁵

Under the new structure, NDMS remains within FEMA, while the CMO is within the new Directorate for Preparedness. While NDMS is logically a response asset, some critics say the proposed structure may blunt the benefit that NDMS might have received from leadership provided by the new CMO position, since that individual would be in a different directorate.

⁷⁹ Jeffrey A. Lowell, “Medical Readiness Responsibilities and Capabilities: A Strategy for Realigning and Strengthening the Federal Medical Response,” report to DHS Secretary Tom Ridge, Jan. 3, 2005, hereafter called the Lowell report, at

<http://www.democrats.reform.house.gov/Documents/20051209101159-27028.pdf>.

⁸⁰ Star Lawrence, “Culture Shock,” *Homeland Protection Professional*, Apr. 2005.

⁸¹ Ibid. This concern had been repeated in the aftermath of Hurricane Katrina. See, for example, Richard Knox, “New Orleans Airport as Field Hospital,” *Morning Edition*, National Public Radio, Sept. 14, 2005.

⁸² Lowell report, p. ii.

⁸³ See CRS Report RL33064, *Organization and Mission of the Emergency Preparedness and Response Directorate: Issues and Options for the 109th Congress*, by Keith Bea; and CRS Report RL33042, *Department of Homeland Security Reorganization: The 2SR Initiative*, by Harold C. Relyea and Henry B. Hogue.

⁸⁴ DHS, “Secretary Michael Chertoff, U.S. Department of Homeland Security Second Stage Review Remarks,” Ronald Reagan Building, Washington, DC, July 13, 2005, at <http://www.dhs.gov/dhspublic/display?theme=44&content=4597&print=true>.

⁸⁵ DHS, “Secretary Michael Chertoff Announces the New Chief Medical Officer for the Department of Homeland Security,” press release, July 14, 2005.

A second organizational concern with the transfer of NDMS to DHS is that NDMS and FEMA take different temporal approaches to deployment in response to a disaster. Historically, DMAT teams trained to be able to deploy rapidly and set up self-supporting field hospitals in austere conditions, without external water or power sources, within the first 72 hours after a disaster, *before* other federal assets arrive.⁸⁶ FEMA has historically operated under the planning assumption that while it would mount a response as soon as possible, state and local officials were responsible for emergency response in the first 72 hours following a disaster.⁸⁷ After Hurricane Katrina, a DMAT team member stated that FEMA was unable to support the historical rapid-deployment capability of NDMS.⁸⁸

NDMS teams are required to submit after-action reports following deployment, in order that response planners can benefit from lessons learned in disaster response. Some analyses of the NDMS response to Hurricane Katrina response have become available, and more are expected, including one from DHS.⁸⁹ Policymakers likely will review the mission of NDMS and its alignment with national goals for terrorism and disaster response. NDMS program authority expires at the end of FY2006. Congress may decide to review the mission of NDMS and the role of DHS and FEMA in supporting it, in general, and specifically in response to Hurricane Katrina, as it considers reauthorization of the program.

Volunteer Health Professionals

Despite the deployment of all FEMA DMAT teams in the wake of Hurricane Katrina, there were reports of overwhelmed field hospitals and triage centers, and urgent calls from hospitals for more medical personnel. On September 3, HHS issued a call for more volunteer health professionals (VHPs) to deploy, as federalized employees, to the affected areas. All officers of the U.S. Public Health Service were also put on alert for possible deployment.⁹⁰ The NDMS, which was transferred from HHS to the DHS in 2002, remains authorized within the Public Health Service Act, where it is stated that the Secretary of HHS can augment emergency response personnel by deploying volunteers as intermittent disaster response personnel under NDMS.⁹¹ Volunteers could also potentially be deployed as temporary volunteers in the Public Health Service, or as temporary federal employees.⁹² By September 19, the call for additional personnel had been lifted.

The licensing of medical professionals is the responsibility of state authorities. Federalized VHPs must hold a current license in at least one U.S. jurisdiction, and the federal agency responsible for

⁸⁶ See comments of Kevin Yeskey, then chief executive officer of NDMS, in Paula Hartman Cohen, "The Three Faces of NDMS," *Homeland Protection Professional*, Aug. 2003.

⁸⁷ See, for example, FEMA, "Can You Go It Alone For Three Days?" press release number: 1354-41, Jan. 31, 2001, at <http://www.fema.gov/news/newsrelease.fema?id=7591>.

⁸⁸ Richard Knox, "New Orleans Airport as Field Hospital," *Morning Edition*, National Public Radio, Sept. 14, 2005.

⁸⁹ See "The Decline of the National Disaster Medical System," Committee on Government Reform, Minority Staff, Special Investigations Division, Dec. 2005, at <http://www.democrats.reform.house.gov/>; and Mimi Hall, "'Significant Gaps' Reported in Disaster Medical System," *USA Today*, Jan. 18, 2006.

⁹⁰ HHS, "HHS Releases Website and Toll Free Number for Deployment by Health Care Professionals," press release, Sept. 3, 2005, and website at <https://volunteer.ccrf.hhs.gov/>.

⁹¹ 42 U.S.C. §300hh-11.

⁹² For a discussion of the three legal mechanisms, see James G. Hodge, Jr., et al., "Hurricane Katrina Response, Legal Protections for Federalized Volunteer Health Personnel under a Federal Declaration of Public Health Emergency," The Center for Law and the Public's Health at Georgetown and Johns Hopkins Universities, memorandum, Sept. 15, 2005, at <http://www.publichealthlaw.net/Research/Katrina.htm>.

deployment bears the burden of verifying credentials. Federalized VHPs are considered to be federal employees for purposes of liability and compensation. VHPs can also deploy at the request of affected states, as long as their state's licensure and certification are recognized by the requesting state. A number of legal mechanisms govern reciprocity in order to assure that VHPs are protected from liability in the requesting state.⁹³ One of the more challenging aspects of accepting mutual aid is the ability to verify an individual's qualifications. The Health Resources and Services Administration (HRSA) notes:

According to reports, hospital administrators involved in responding to the World Trade Center tragedy reported that they were unable to use medical volunteers when they were unable to verify the volunteer's basic identity, licensing, credentials (training, skills, and competencies), and employment. In effect, this precious, needed health workforce surge capacity could not be used.⁹⁴

Following the terrorist attacks of 2001, Congress established a program to develop a national database for verifying the licensure and credentials of VHPs during emergencies.⁹⁵ The *Emergency System for Advance Registration of Volunteer Health Professionals* (ESAR-VHP), administered by HRSA, is designed to assist state and local authorities in verifying the status of volunteer healthcare workers by developing standards for a nationwide database and providing funding and technical assistance to states in linking to it. The program is in its early stages, with pilots beginning in several states, and was not ready for use in response to Hurricane Katrina. The program was funded at \$8 million in FY2005. The Administration requested \$8 million for FY2006, and Congress provided \$4 million in final appropriations. Senate appropriators had commented that states could use their hospital preparedness grant funds to support this activity. Authority for the ESAR-VHP program expires at the end of FY2006.

While Congress has explicitly tasked HHS, through HRSA, with a federal role in creating a nationwide system for health professionals volunteers, the DHS Chief Medical Officer (CMO) has also voiced an interest in coordinating this activity.⁹⁶ DHS is expected to publish, in the Federal Register, a notice of delegation of authority to the CMO. Until such time, comprehensive information on the scope of the responsibilities and activities of this office, and how the CMO will coordinate efforts with HHS, is not publicly available.

The federal role in assisting states with licensure verification and other matters involved in using VHPs during an emergency has been of interest to Congress. Relevant legislation introduced following Hurricane Katrina includes S. 1638, which would establish a National Emergency Health Professionals Volunteer Corps under the Secretary of HHS, among other provisions, and H.R. 3736, which would provide Hurricane Katrina volunteers, including health workers, immunity from liability. The latter bill has passed the House and been referred to the Senate Judiciary Committee.

⁹³ See CRS Report RS22255, *Emergency Response: Civil Liability of Volunteer Health Professionals*, by Kathleen Swendiman and Nathan Brooks.

⁹⁴ See HRSA, *Emergency System for Advance Registration of Volunteer Health Professionals*, background, at <http://www.hrsa.gov/bioterrorism/esarvhp/>.

⁹⁵ 42 U.S.C. § 247d-7b.

⁹⁶ Comments of Jeffrey Runge, Chief Medical Officer, Department of Homeland Security, before the House Committee on Homeland Security, Subcommittee on Management, Integration, and Oversight, hearing on "The Department of Homeland Security Second-Stage Review: The Role of the Chief Medical Officer," Oct. 27, 2005, 109th Congress, 1st sess., Washington, D.C., CQ Transcriptions.

Health Information Technology

In response to Hurricane Katrina, the HHS Office of the National Coordinator for Health Information Technology, working in collaboration with more than 150 public and private healthcare organizations, established an online service for authorized health professionals to gain electronic access to prescription medication records for evacuees. Medication data from a variety of government and commercial sources—Medicaid, the Veteran’s Health Administration, private insurers, and pharmacy benefit managers—was indexed and made accessible through a single Internet portal (www.katrinahealth.org) to any licensed physician or retail pharmacist. Comparable efforts made the immunization records of children who evacuated from Louisiana available to public health officials in host states, and, through the use of Medicaid billing records, allowed the reconstruction of rudimentary health records for some of those who were displaced.⁹⁷

HHS Secretary Leavitt noted that the disaster had made the case for a national system of electronic health records (EHR), and that such a system could be useful in general as well as for other emergencies such as pandemic influenza. The VA, which uses a system of electronic health records for its beneficiaries, was able to provide uninterrupted care to several hundred veterans who were evacuated from its medical centers in Biloxi, Mississippi, and New Orleans, Louisiana, due to the hurricane.

Congress has taken several steps in recent years to implement a nationwide health information technology (health IT) infrastructure.⁹⁸ Several bills have been introduced in the 109th Congress to boost federal investment and leadership in health IT and provide incentives both for EHR adoption and for the creation of regional health information networks, which are seen as an important step towards the goal of interconnecting the health care system nationwide. (Examples include H.R. 2334, S. 1262 and S. 1355.) On November 18, 2005, the Senate passed a bipartisan health IT bill, S. 1418, which has been referred to the House for further consideration.

Additional CRS Reports

CRS Report RS22292, *Hurricanes Katrina & Rita: Addressing the Victims’ Mental Health and Substance Abuse Treatment Needs*, by Erin D. Williams.

CRS Report RS22279, *Hurricane Katrina and Veterans*, by Sidath Viranga Panangala.

CRS Report RL33083, *Hurricane Katrina: Medicaid Issues*, by Evelyne Baumrucker, April Grady, Jean Hearne, Elicia Herz, Richard Rimkunas, Julie Stone, and Karen Tritz.

CRS Report RS22254, *The Americans with Disabilities Act and Emergency Preparedness and Response*, by Nancy Lee Jones.

CRS Report RS22255, *Emergency Response: Civil Liability of Volunteer Health Professionals*, by Kathleen Swendiman and Nathan Brooks.

CRS Report RS22252, *Older Americans Act: Disaster Assistance for Older Persons After Hurricane Katrina*, by Carol O’Shaughnessy.

⁹⁷ See Jennifer Jones and Bob Brewin, “Dodged the Storm but not the Crisis; Diaspora Dispatches,” *Federal Computer Week*, Nov. 14, 2005; and CRS Report RS22310, *Hurricane Katrina: HIPAA Privacy and Electronic Health Records of Evacuees*, by Gina Marie Stevens.

⁹⁸ See CRS Report RL32858, *Health Information Technology: Promoting Electronic Connectivity in Healthcare*, by C. Stephen Redhead.

CRS Report RS22235, *Disaster Evacuation and Displacement Policy: Issues for Congress*, by Keith Bea.

CRS Report RL32803, *The National Preparedness System: Issues in the 109th Congress*, by Keith Bea.

CRS Report RL32858, *Health Information Technology: Promoting Electronic Connectivity in Healthcare*, by C. Stephen Redhead.

CRS Report RS22310, *Hurricane Katrina: HIPAA Privacy and Electronic Health Records of Evacuees*, by Gina Marie Stevens.

CRS Report RL31719, *An Overview of the U.S. Public Health System in the Context of Emergency Preparedness*, by Sarah A. Lister.

Author Information

Sarah A. Lister
Specialist in Public Health and Epidemiology

Disclaimer

This document was prepared by the Congressional Research Service (CRS). CRS serves as nonpartisan shared staff to congressional committees and Members of Congress. It operates solely at the behest of and under the direction of Congress. Information in a CRS Report should not be relied upon for purposes other than public understanding of information that has been provided by CRS to Members of Congress in connection with CRS's institutional role. CRS Reports, as a work of the United States Government, are not subject to copyright protection in the United States. Any CRS Report may be reproduced and distributed in its entirety without permission from CRS. However, as a CRS Report may include copyrighted images or material from a third party, you may need to obtain the permission of the copyright holder if you wish to copy or otherwise use copyrighted material.